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SEEDING FOR RANGE IMPROVEMENT

SPECIES • ADAPTATIONS
METHODS • MANAGEMENT



Compiled by

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RANGE SEEDING

RANGE SEEDING has reached large proportions in recent years as a result of research by the College of Agriculture and extensive field tests carried on by the College and its Farm Advisors in many counties. In initiating a program of range improvements the experience gained from these tests should be determined and used as a guide to practices and plant species to be used.

It is the purpose of this booklet to aid in promoting sound practices that will lead to the permanent improvement of dry land forage resources. Both the advantages and limitations are therefore briefly stated.

TIME OF SEEDING: In practically all of California fall seeding is recommended so that germination and growth may have full advantage of the winter rains, but planting too early is hazardous. There may be an early rain, sufficient to germinate the seed, followed by a long dry period before the regular rainy season arrives. Seeding time of the most successful dry land grain growers is a good guide to range re-seeding. An exception to this rule is found in seeding in the ash of brush burns, as noted below. Here it is desirable to have the seed in the ash before it is compacted by rain.

In any event, an operation that is as dependent on weather as is dry land seeding should be planned well in advance and executed at the most advantageous time. One of the requisites of this is fore-seeing seed needs and having supplies on hand well before they are needed. The difference between success and failure may hinge upon the essential detail of timeliness.

AMOUNTS OF SEED: In dry land seeding, moisture is a great limiting factor. These areas will not usually support dense stands of deep-rooting perennials, and even the seeded annuals are likely to become dwarfed when the stand is too thick. Extensive tests have shown that from 7 to 12 pounds of total seed per acre are sufficient for most sites where the rainfall is adequate to justify any range seeding.

KNOW WHAT YOU SOW: Most range land is comparatively low in valuation and in per acre returns. Even a slight increase in the quantity and quality of the cover may bring about a marked increase in the annual return and value of the land. Certain fixed costs are essential to these results. The risk should not be exaggerated by planting seeds of poor or uncertain quality. Range weeds are always a problem of major proportions. Seeds with a high weed content only aggravate this condition. It is sound business to sow only seeds of high germination, known identity, free from weed seeds. Pure seed is a sound investment.

METHODS OF SEEDING: A Cultipacker-seeder is the most suitable machine for sowing and covering on a prepared seedbed. On most rough range lands it is practically impossible to secure uniform depth in drilling seed. Some range topography does not permit the use of a drill. Broadcasting is satisfactory if there is a firm seedbed. If the soil is corrugated by cultipacking, or by a shallow disking or springtooothing, rain will usually cover the seed satisfactorily. If the soil is smooth, seeding should be followed by a light harrowing or cultipacking. *A firm seedbed is essential.* Small seed planted in freshly-plowed, loose soil is wasted.

SOWING ON SOD is precarious business. Only a few species are adapted to this use and seed losses will then be heavy, but later volunteering may thicken the stand. When this practice is to be followed the resident cover should be mowed and raked, or closely grazed so that the seed can fall on exposed soil. The species that will give the best result in this kind of sowing are: bur clover, rose clover, subclover, birdsfoot trefoil, annual and perennial ryegrasses, burnet and filaree. Arable sod can be disked and then seeded and managed as described below with better results in plant stands.

SOWING ON A PREPARED SEEDBED: The best preparation for reseeding is to fallow the land for a year and keep it free from weeds. Fallow is as useful for a forage crop as it is for small grains. It serves to reduce the competition of resident growth and to accumulate some free nitrogen which helps to give the seeded plants a good start and to promote stooling. If the fallow is soft and loose at seeding time a cultipacker should be used to firm it. A firm seedbed is essential to success.

The stubble of grain, vetch and grain, or sudan usually leaves a condition favorable for pasture seeding. A light disk, cutting the soil only to a depth of one and a half to two inches, but turning it thoroughly, will usually suffice. Seed can be broadcast directly on the disked soil without covering. Better results will usually follow if the seed is firmed into the soil with a cultipacker.

SEEDING IN BRUSH BURNS: Seeding in the ash of heavy brush burns has been found to be a promising method of revegetating such areas with the best adaptable species. There are several sound reasons for this:

(1) The competition of resident plant cover is not severe in such areas and this enables the seeded plants to get the full benefit of both sunlight and moisture; (2) Brush ash is rather rich in available fertilizer elements, especially nitrogen; (3) The ash of a burn provides a good covering for the seed. To get full advantage of this, seeding should be done before the ash has been compacted by the fall rains, or by prolonged action of wind, dew and frost.

Areas where brush has been removed by mechanical methods also usually furnish moderately good seedbed conditions and the same freedom from competition as noted above.

MANAGEMENT: Experience has showed that the three most restrictive factors in range revegetation through seeding are: (1) First-year competition of resident plants; (2) Moisture limitations during the critical dry summer; (3) Prolonged or untimely overgrazing.

The first of these must be carefully controlled, especially in the first year after seeding. Where the topography permits, a mower is the best means of reducing resident grasses and weeds. Mowing should be done at the most favorable time to preserve moisture and prevent seed production. Several mowings may be essential to the best results.

Where it is too rough or too steep for mowing, seeded areas should be rather closely grazed as soon as the resident growth reaches pasturable proportions, and while this growth

is green and most nutritious and before its seeds are formed. This will serve to admit sunlight to the slower starting seeded plants and to reduce the seed yield of resident competition. Then remove stock while there is sufficient moisture in the soil to promote the continued growth of seeded plants.

NOTE: The above grazing practices do not apply to seeding in brush burns. When grazed too early, plants sown in ash are likely to be pulled out and the young roots thus destroyed. *On burns, first-year grazing should be delayed until the sown plants have set seed.*

ROTATION GRAZING: After the first year, a system of rotation grazing should be adopted, such as described in Extension Circular No. 129 (see references on back page). Seeding cannot be effective or permanent in improving range forage unless grazing practices are so applied that the plants have an opportunity to nourish themselves by reaching an advanced stage of maturity at least once in each cycle of 3 to 5 years. Every range seeding project should be accompanied by a program of adjusted grazing.

SPECIES AND ADAPTATIONS: In the course of its range improvement program the College of Agriculture has tested several hundred species of plants from all parts of the world. Many have been discarded as not adapted to conditions prevailing in California. All of those that remain on their active list are charted on the inside of this booklet.

Some species, such as the grama grasses, are very drought tolerant, but require summer rains and are therefore not adaptable to California conditions. Some others, such as the love grasses, require spring planting in warm soil.

Some of the plants that are recommended have rather narrow limits of adaptation, others succeed over a wide soil and climatic range. The primary points in adaptations are given on the chart of species. Further information can be had from the references cited.

Standard mixtures might be made up of those species that are recommended in at least five of the six climatic zones. Alfalfa, Mountain Brome and Sweet Clover are found in all six. Annual Ryegrass, Subclover, Harding Grass and Burnet occur in all but Zone 6, and Tall Fescue in all but Zone 5. Harlan Brome, the Stipas, Smilo and Rose Clover could be added over most of the zones. All zones have special problems and no fixed formula would fit all of them.

ZONE MAP: The Zone Map presented in this folder is an effort to coordinate elevation, rainfall and plant zones. Zone 7 is not considered since rainfall there is too low for any seeding operations. In Zone 5A, also, rainfall is too low for any dry land plantings except possibly with Stipas, Bur, Rose Clover and Subclovers, Filaree, and Annual Ryegrass.

REFERENCES

For additional details regarding range seeding and management, write or contact Pasture Department, C. M. Volkman & Company, 55 Union Street, San Francisco 11, California. Local County Farm Advisors may also be excellent sources of information, since they are constantly in touch with local conditions. Further information can be secured from the College of Agriculture, Extension Circular No. 129, entitled "Range Improvement in California," and from the same source, Circular No. 371 entitled "Improving California Brush Ranges."



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